REMARKS:

Claims 1-22 are pending. Claims 1-5, 7, and 11-22 are rejected under 35 U.S.C. § 102(e) as being anticipated by over U.S. Patent No. 6,363,378 to Conklin et al. Claims 6 and 8-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,363,378 to Conklin et al.

Reconsideration is requested. No new matter is added. The rejections are traversed. Claim 17 is amended to clarify the invention. Claim 18 is canceled. Claims 1-17 and 19-22 remain in the case for consideration.

The Examiner included initialed copies of the first pages of Forms PTO-1449 as submitted by the Applicant on June 23, 2000 and March 5, 2002, but failed to include an initialed copy of the second page of the Form PTO-1449 submitted on June 23, 2000 (including a single additional reference titled "Wordnet – A Lexical Database for English"). The Applicant requests that the Examine provide the Applicant with an initialed copy of the second page of Form PTO-1449 as submitted on June 23, 2000, indicating that the Examiner has considered the reference listed thereon.

REJECTIONS UNDER 35 U.S.C. § 102(e):

The invention as recited in claim 1 is directed toward a method for building a directed set for use in determining the context of a question. A plurality of concepts is identified. One concept is identified as the maximal element. Chains are established from the maximal element to every other concept. One or more chains are selected as a basis, and how concretely each concept is represented by the basis chains is measured. Claim 11 is a Beauregard claim similar in scope to claim 1. Claim 12 is a data structure stored in memory representing the directed set and basis chains. Claims 15 and 16 are directed to various aspects of an apparatus capable of performing the method of claim 1.

In contrast, Conklin teaches an information retrieval system. Nodes, depicting terminological concepts, are arranged into trees. A query is analyzed to determine query feedback terms, and corresponding terminological concepts are selected as query feedback nodes. Focal nodes are selected based on the topics, and a conceptual proximity is measured between the focal nodes and query feedback nodes. The query feedback nodes are then ranked based on conceptual proximity to the focal nodes.

There are several apparent differences between the invention as recited in claims 1, 11, 12, 15, and 16 and Conklin. First is that the claimed invention uses a directed set. As explained in the paragraph beginning on page 21, line 5 of the specification, a directed set is a different concept than a tree. Among other (mathematically equivalent) definitions, a tree is a set of nodes

connected by edges, the tree having no self-loops and such that between any two nodes in the tree there is *exactly one* path between the two nodes. (See, e.g., SHIMON EVEN, GRAPH ALGORITHMS 22 (1979).) Graph Algorithms by Shimon Even, p. 22) A directed set has no such limitation. A directed set, in contrast, is a set of nodes connected by edges, where there can be any number of distinct paths between the maximal element and any other element in the directed set. Indeed, as shown in the FIG. 4 of the instant application, there are two different paths between "set" and "relation." One path goes through "product," the other path goes through "subset." Since a tree cannot have multiple paths between a pair of nodes, the trees of Conklin do not anticipate the directed set of the instant invention.

Although Conklin does not describe his trees as directed trees, even if Conklin's trees were considered to be directed trees, they would not teach the concept of a directed set. One definition of a directed tree is a set of nodes connected by edges, where the set has a root from which there is a *unique* directed path to every other node. (See, e.g., SHIMON EVEN, GRAPH ALGORITHMS 30 (1979).) Since this definition still limits the directed tree to having a unique path between the root and every other node, a directed tree does not anticipate the directed set of the instant invention either.

A second difference is that Conklin supports the concept of multiple trees. This is shown in both figures 3 and 6 of Conklin, and explained at column 7, lines 39-50 (among other places). Each tree is an "independent ontology." But a consequence of having separate trees is that there can be no individual maximal element, as claimed in the instant invention. At best, each tree can have a maximal element. But without anything tying the different trees together, there is no single maximal element that embraces every concept in every tree.

By using separate trees for different ontologies, Conklin teaches a system wherein some elements cannot be compared. For example, referring to FIG. 6 of Conklin, there is no way to compare Western Europe with Tourism, as they are in different ontologies. This would akin to attempting to compare the concept "apple" with the concept "Thursday": there is no common reference point by which the concepts can be compared. In contrast, in the directed set of the instant invention, every pair of concepts has a common ancestor. At worst, every pair of elements are related through the maximal element. This makes it possible to compare disparate concepts such as "iguana" and "man."

Conklin might be said to teach the establishing of chains, in that there is a path between any two nodes in a tree. But Conklin makes no mention of any significance to chains, and does not even use the term. And even if Conklin could be said to teach establishing chains, Conklin teaches nothing about selecting chains to form a basis. In mathematics, a basis is a set of vectors or other objects that span a subspace. [While it might not appear that the chains that make up the

basis span a subspace, in fact they do.] Conklin has no analog to the concept of selecting chains to form a basis. In addition, the concept of a "basis" is a well-defined concept. (See, e.g., STEWART VENIT & WAYNE BISHOP, ELEMENTARY LINEAR ALGEBRA 146 (2d ed. 1985).) Had Conklin intended to teach forming a basis for a subspace, he would have used the term. That he did not use the term "basis" anywhere in his patent makes clear that he does not view his "chains" (undefined as they are) as forming a subspace.

The Examiner points to figure 4 and column 7, line 62 through column 9, line 26 of Conklin as teaching selecting chains to form a basis. It is unclear to what the Examiner is referring. The Applicant can only infer that the Examiner is reading Conklin's weighting approach as forming a basis. But this reading of Conklin fails for two reasons. First, selecting chains for the basis has nothing to do with measuring the distance between the basis chains and concepts in the directed set, to which weighting would be applicable. Second, Conklin's weighting approach is highly dependent on the terms being searched in the trees, whereas the basis chains in the instant invention are selected without regard to any particular terms that might be searched.

Finally, the instant invention teaches measuring how closely each concept is represented in the basis chains. This involves measuring a distance between a node in the directed set, and *a set of nodes*. Conklin measures the distance between specific pairs of nodes: a focal node and a query feedback node. As the objects being compared are quite different in the instant invention as compared with Conklin, Conklin cannot anticipate the measurement taught in the instant invention.

The invention as defined by claim 1 is directed toward:

> A method for building a directed set to allow a user of a computer system to find a context in which to answer a question, the method comprising:
>
> identifying a plurality of concepts *to form a directed set*, wherein *one concept is a maximal element*;
>
> *establishing chains in the directed set from the maximal element* to each concept;
>
> *selecting one or more chains in the directed set as a basis*; and
>
> *measuring how concretely each concept is represented in each chain in the basis.*

(claim 1; italics added). As these features are not taught or suggested by Conklin, claim 1 is patentable under 35 U.S.C. § 102(e) over Conklin. Accordingly, claims 1-10 are allowable. In a similar manner, claims 11-16 are also allowable.

The invention as recited in claim 17 is directed toward a method for using a directed set to find a context to aid in answering a question. The question is parsed into concepts. Distances between the concepts in the directed set are measured, and the distances are used to determine a

context for the question. Claim 19 is a method for refining a query using a lexicon, similar in scope to claim 17 albeit more generally. Claim 20 is an apparatus capable of listening to a content stream, parsing the content stream into concepts, and measuring the distances between the concepts.

As explained above with reference to claims 1, 11, 12, 15, and 16, Conklin does not teach establishing chains, selecting chains for a basis, and measuring how concretely each concept is represented in each basis chain. In addition, Conklin does not teach creating a multi-dimensional vector for each concept, where each dimension in the vector represents how concretely the concept is represented in one of the basis chains. As a consequence, Conklin cannot teach measuring a distance between vectors, and claim 17 should be allowable.

With regard for the invention as recited in claim 19, Conklin does not teach refining the query or submitting the refined query to the query engine. Accordingly, claim 19 should be allowable.

As the Examiner rejected claims 20-22 on the same basis as claims 1, 11, 12, and 15, all of which have been shown above to be allowable, claims 20-22 should also be allowable.

The invention as defined by claim 17 is directed toward:

> A method for a user of a computer system to find a context to aid in answering a question, the method comprising:
>
> parsing the question into one or more parsed concepts;
>
> *establishing one or more chains in a directed set*, wherein each chain is rooted at a maximal element in the directed set and extends to a concept in the directed set;
>
> *creating a distance vector for the one or more parsed concepts in the directed set, wherein each distance vector includes as its components the measure of how concretely the concept is represented in each chain*; and
>
> *measuring a distance between the distance vectors for each pair of parsed concepts*; and
>
> using the distances between the one or more parsed concepts to establish a context for the question.

(claim 17; italics added). As these features are not taught or suggested by Conklin, claim 17 is patentable under 35 U.S.C. § 102(e) over Conklin. Accordingly, claim 17 is allowable.

The invention as defined by claim 19 is directed toward:

> A method for using a lexicon to submit a refined query input by a user to a query engine, wherein the refined query the method comprising:
>
> parsing the query into one or more parsed concepts;
>
> measuring distances in the lexicon between the one or more parsed concepts;

using the distances between the one or more parsed concepts to establish a context for the query;

refining the query according to the context for the query; and

submitting the refined query to the query engine.

(claim 19; italics added). As these features are not taught or suggested by Conklin, claim 19 is patentable under 35 U.S.C. § 102(e) over Conklin. Accordingly, claim 19 is allowable.

REJECTIONS UNDER 35 U.S.C. § 103(a):

The Examiner rejected claims 6 and 8-10 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,363,378 to Conklin et al. As claims 6 and 8-10 are all dependent from claim 1, which has been shown to be allowable over Conklin et al., claims 6 and 8-10 are also allowable.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version with Markings to Show Changes Made."

Applicant respectfully submits that each of the Examiner's rejections has been overcome and that this Application is in condition for allowance. Such is respectfully requested.

If any questions remain, please call the undersigned.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please amend claim 17 as follows:

17. (First Amendment) A method for a user of a computer system to find a context to aid in answering a question, the method comprising:

parsing the question into one or more parsed concepts;

[measuring distances in a directed set between the one or more parsed concepts;] establishing one or more chains in a directed set, wherein each chain is rooted at a maximal element in the directed set and extends to a concept in the directed set;

creating a distance vector for the one or more parsed concepts in the directed set, wherein each distance vector includes as its components the measure of how concretely the concept is represented in each chain; and

measuring a distance between the distance vectors for each pair of parsed concepts; and

using the distances between the one or more parsed concepts to establish a context for the question.

Please cancel claim 18.